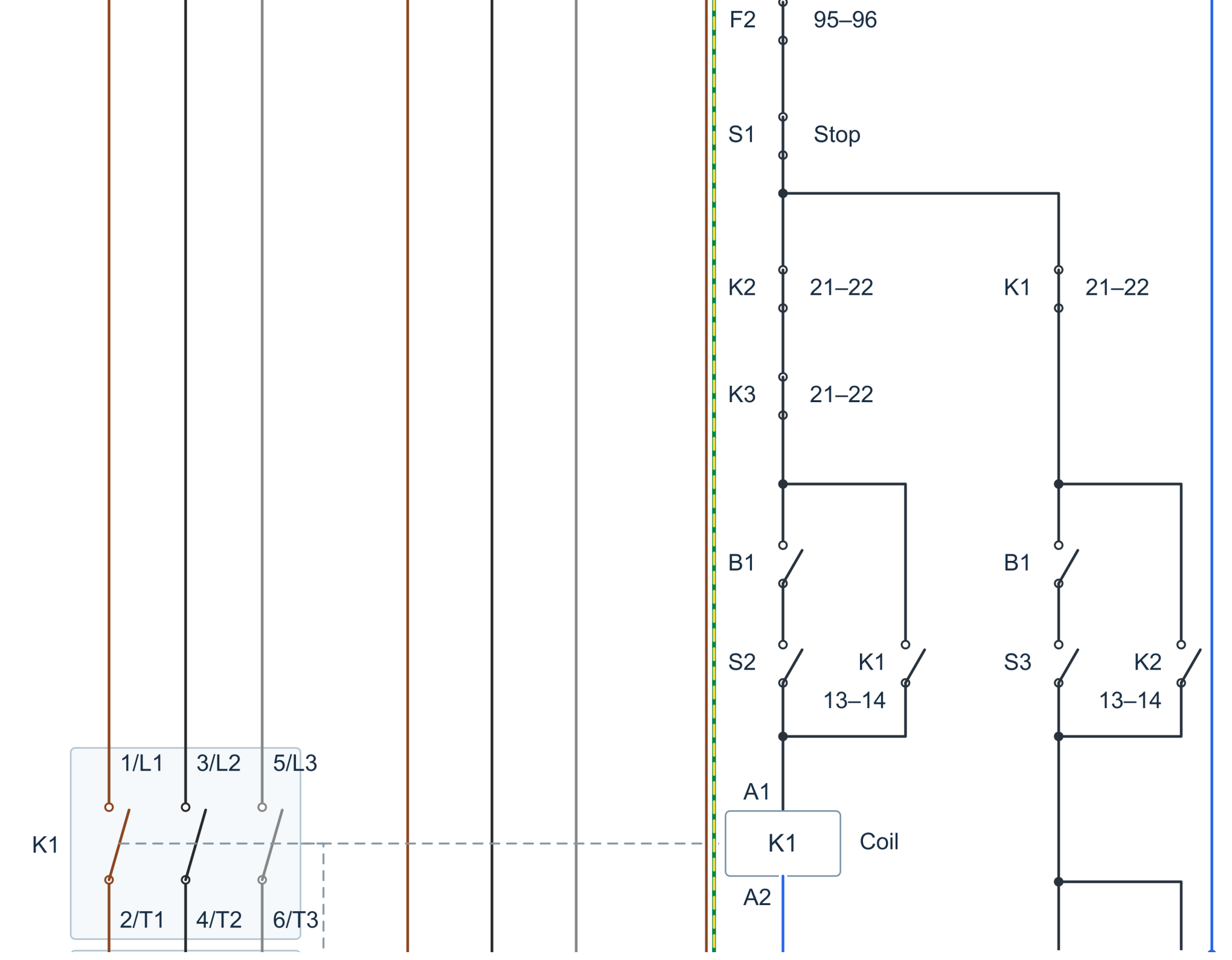
Dahlander circuit: two speed steps

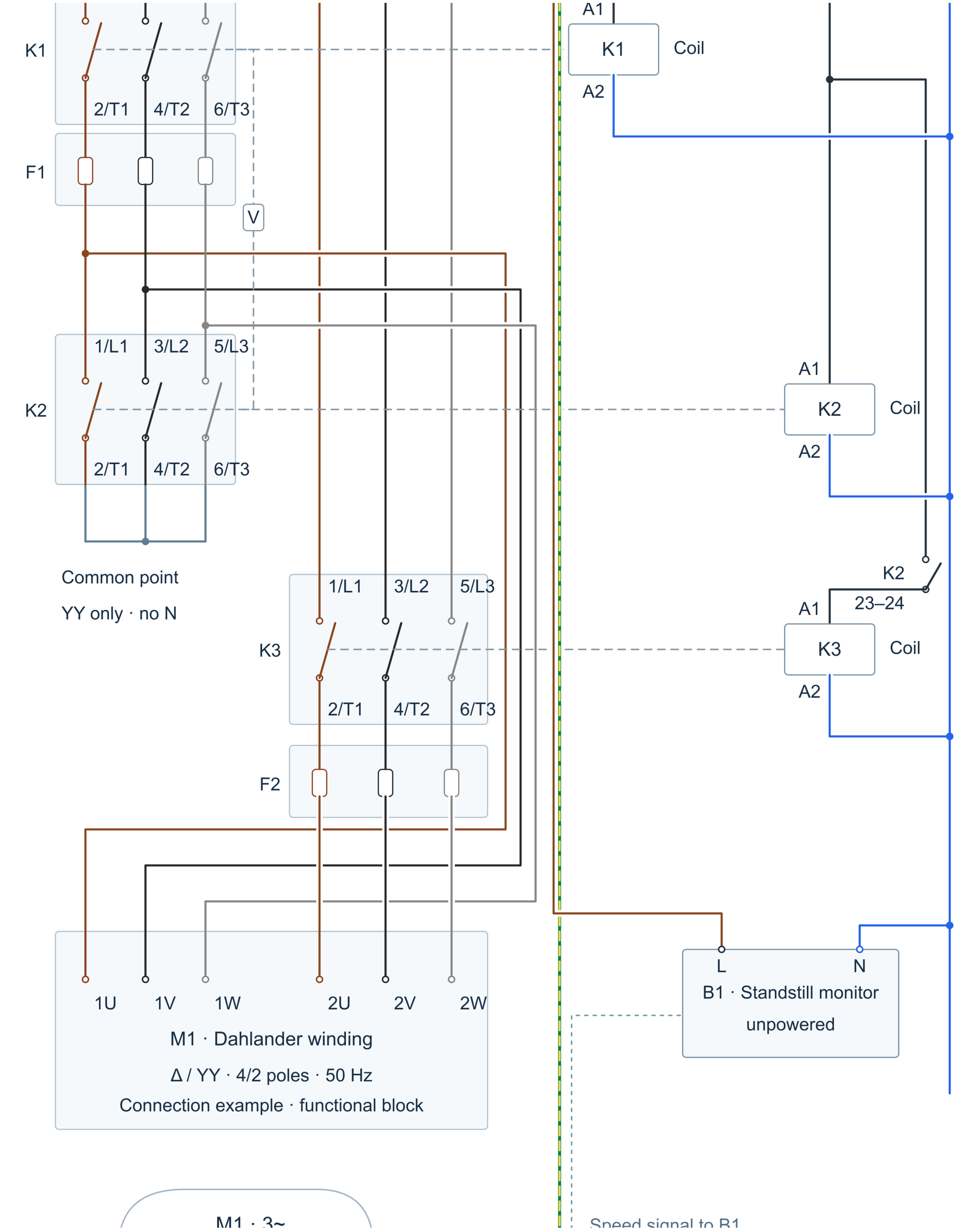
Circuit diagram detail · Dahlander Delta/YY · 1



Overlapping details of the same diagram; conductors at a sheet boundary continue on the following sheet. No additional terminals.

Dahlander circuit: two speed steps

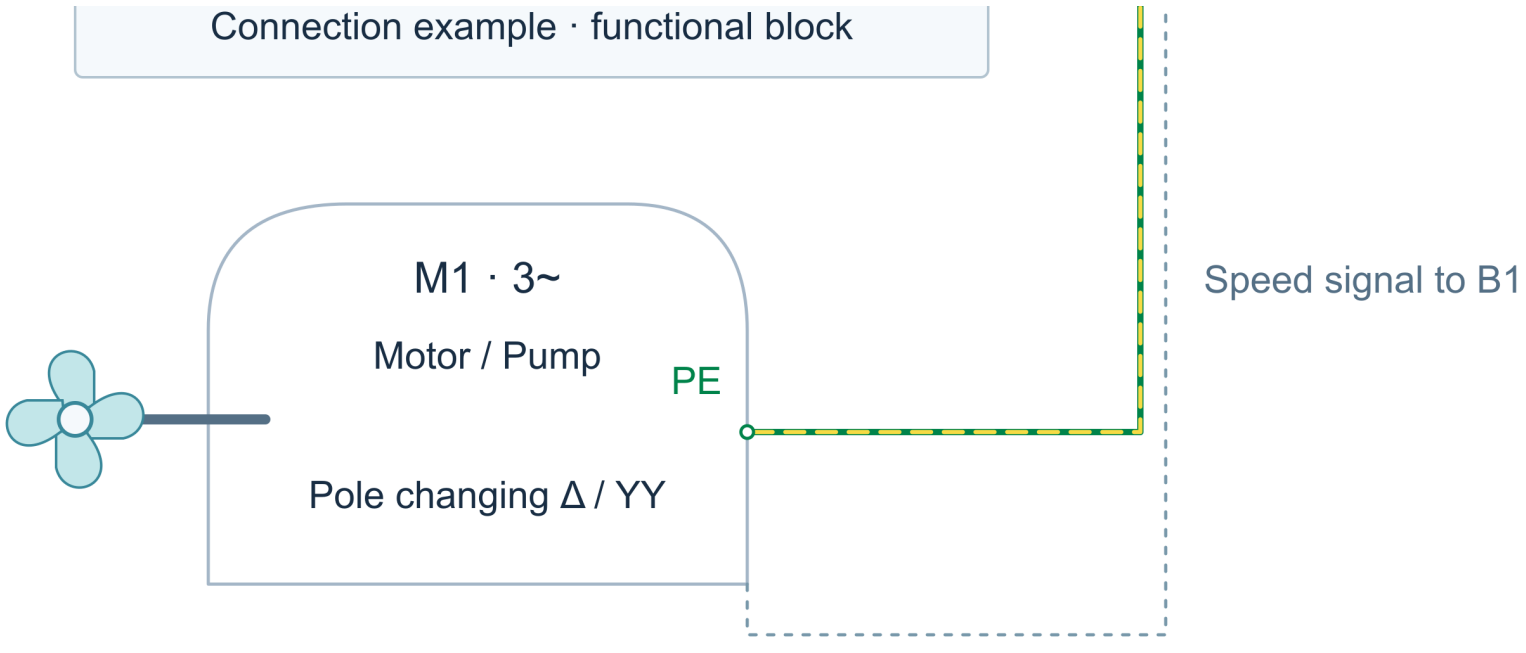
Circuit diagram detail · Dahlander Delta/YY · 2



Overlapping details of the same diagram; conductors at a sheet boundary continue on the following sheet. No additional terminals.

Dahlander circuit: two speed steps

Circuit diagram detail · Dahlander Delta/YY · 3



Red: control at L1 · bold: active load path · PE unswitched
Dashed: mechanical action · V: K1/K2 mechanical interlock
B1: additional · change speed via Stop and detected standstill
Δ/YY example: low at 1U/1V/1W · high at 2U/2V/2W
K2 joins 1U/1V/1W only in YY · block, not a universal winding diagram
Example: 4/2 poles, 50 Hz · simplified motion/coasting · no load calculation

Overlapping details of the same diagram; conductors at a sheet boundary continue on the following sheet. No additional terminals.

Dahlander circuit: two speed steps

Explanation, operating trials and model limits

A Dahlander motor has a specially designed pole-changing winding that provides two speed steps (https://www.simple-elektrotechnik.at/en/contactor-circuits/contactor-circuits-compared). Adding contactors does not turn an ordinary star-delta winding into a Dahlander winding.

Structure and operation

This model uses a documented Δ/YY example with 1U/1V/1W and 2U/2V/2W. K1 supplies the first group for low speed. At high speed, K2 joins that group into a common point while K3 supplies the second group. The internal winding remains a functional block.

Reading the example

At low speed, K1 holds through its auxiliary NO contact. At high speed, K2 holds through 13-14 and enables K3 through its additional NO contact 23-24. These assignments apply to the illustrated example. F1 and F2 monitor the different supply paths; their shutdown contacts precede the start/holding branches. K1 is electrically and mechanically interlocked against the high-speed combination.

Connections and equipment selection

Additional B1 enables starts only after detected standstill here. Speed changes are via Stop; the opposite command alone does not end the active speed. This deliberately chosen variant is not inherent in every Dahlander control. The motor’s terminal diagram remains decisive; six visible terminals alone do not establish its type.

Try the model

Start and latch low speed; try the opposite command.

Stop, follow coasting and B1, then start high speed.

Observe K2/K3 as the high-speed pair and the separate protection paths.

Trip F1 and F2 individually; distinguish reset with Start free from starting again.

Benefits and limits

At a fixed frequency, the 4/2-pole example halves pole count and doubles synchronous speed. At 50 Hz, four and two poles correspond to 1500 and 3000 min^-1 synchronously. Nameplate running speeds differ because of slip. Only the intended steps are available; switching stress and protection must cover both.

The model explains a functional example. Real installation work requires appropriate competence, authorisation and safe working procedures; normal Stop is not safe isolation. Functional testing and electrical safety verification remain separate.

Related explanations

Difference from star-delta (https://www.simple-elektrotechnik.at/en/contactor-circuits/star-delta-starting-contactor-circuit)

Direction selection (https://www.simple-elektrotechnik.at/en/contactor-circuits/reversing-contactor-circuit)

Compare contactor circuits (https://www.simple-elektrotechnik.at/en/contactor-circuits/contactor-circuits-compared)

Dahlander circuit: two speed steps

Explanation and sources - continued

Contactor circuits overview (https://www.simple-elektrotechnik.at/en/contactor-circuits)

Sources and equipment documents

Schneider Electric: Zwei-/Dreileitersteuerung / Two- and three-wire control (https://www.se.com/uk/en/faqs/FA147367/)

VEM: Klemmenplan / Terminal diagram KP 0003 Δ/YY (https://www.vem-group.com/files/downloads/klemmplaene/KP0003_de.pdf)

Further context: Relays and contactors (https://www.simple-elektrotechnik.at/en/switching-devices/installation-relays-and-contactors) · Functional testing (https://www.simple-elektrotechnik.at/en/testing-and-measurements/functional-testing)

https://www.simple-elektrotechnik.at/en/contactor-circuits/dahlander-contactor-circuits

Linked explanations and sources

Compare contactor circuits
Difference from star-delta
Direction selection
Contactor circuits overview
Schneider Electric: Zwei-/Dreileitersteuerung / Two- and three-wire control
VEM: Klemmenplan / Terminal diagram KP 0003 Δ/YY
Relays and contactors
Functional testing
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